C L A I M S

1. A method of manufacturing pneumatic tyres for vehicle wheels, comprising the following steps:

- assembling a tyre being processed on a toroidal support (10) having an outer surface the shape of which substantially matches that of an inner surface of the tyre itself, building at least one carcass structure (20) on said support (10), said carcass structure (20) comprising a radially internal layer containing elastomer material in contact with the outer surface of the toroidal support (10), at least one carcass ply the ends of which are associated with at least one bead structure comprising at least one annular reinforcing structure and an elastomer filler;
- closing the toroidal support (10) and the tyre under processing assembled therewith into a hermetically sealed cavity (110);
- admitting a working fluid into said cavity (110) pressing the inner surface of said tyre being processed against the outer surface of said toroidal support (10);
- supplying heat to said tyre being processed to start vulcanisation of at least one elastomer element of the carcass structure (20) selected between said elastomer filler and said radially internal layer;
- extracting said toroidal support (10) carrying said tyre being processed from said cavity (110);
- completing building of the tyre being processed;
- closing the built tyre and the toroidal support (10) within a moulding cavity defined in a vulcanisation mould, said moulding cavity having walls conforming in shape to an outer surface of the tyre when vulcanisation has been completed;
- moulding the tyre by pressing it with its outer

surface against the walls of the moulding cavity;
- supplying heat to the built tyre to vulcanise it.

2. A method as claimed in claim 1, wherein said tyre being processed comprises a belt structure associated with said carcass structure.

3. A method as claimed in claim 1, wherein said step of admitting said working fluid comes before said step of supplying heat to said tyre being processed.

4. A method as claimed in claim 1, wherein said step of admitting said working fluid takes place substantially concurrently with said step of supplying heat to said tyre being processed.

5. A method as claimed in claim 1, wherein said step of supplying heat takes place by heat generation on the surface of said toroidal support (10).

6. A method as claimed in claim 1, wherein said step of supplying heat takes place by heat generation at the inside of said tyre being processed.

7. A method as claimed in claim 5, wherein said heat generation occurs by magnetic induction over a period of time included between about one minute and about six minutes.

8. A method as claimed in claim 5, wherein pressure generated by said fluid in said hermetically sealed cavity is included between about 5 and about 15 bars.

9. A plant for manufacturing pneumatic tyres, comprising:

- at least one building station comprising an automated apparatus for handling a toroidal support (10) on which each green tyre is built, said toroidal support having an outer surface the shape of which substantially matches that of an inner surface of the tyre itself;
- at least one apparatus (100) to carry out a partial vulcanisation of said green tyre being processed, said apparatus comprising: at least one hermetically sealed cavity (110) set to receive the toroidal support (10) carrying the tyre being processed, at least one heating device to generate heat at least on the surface of the toroidal support (10), at least one device for feeding working fluid under pressure, associated with said cavity (110), to press the radially internal surface of the tyre being processed against the radially external surface of said toroidal support (10);
- at least one apparatus for vulcanising and moulding said green tyre once it has been built.

10. An apparatus as claimed in claim 9, wherein said heating device comprises at least one magnetic inductor (150).

11. A plant as claimed in claim 9 wherein said toroidal support (10) has an outer surface of ferromagnetic material.

12. A plant as claimed in claim 9, wherein said hermetically sealed cavity (110) is delimited by a lower half (102A) and an upper half (102B) of said apparatus (100).

13. A plant as claimed in claim 12, wherein said upper half (102B) is linked to said lower half (102A) by at least one hinge (111) enabling rotation of same on the

vertical plane of said apparatus (100).

14. A plant as claimed in claim 12, wherein at least one sealing element (107) is provided between the opposite surfaces of said lower (102A) and upper (102B) halves.

15. A plant as claimed in claim 10, wherein said magnetic inductor (150) is an annular inductor having a C-shaped transverse section and placed close to the inner side walls of said apparatus (100).

16. A plant as claimed in claim 10, wherein said magnetic inductor (150) has a power included between about 25 KW and about 60 KW.

17. A plant as claimed in claim 9, wherein said device for feeding working fluid contemplates the presence of a delivery duct (10) and an exhaust duct (109).

18. A plant as claimed in claim 12, wherein abutment surfaces (114) are provided to horizontally support said toroidal support (10) within said cavity (110).

19. A plant as claimed in claim 18, wherein said abutment surfaces (114) are operatively associated with hydraulic devices to exert pressure on the shoulder regions of said toroidal support (10).

20. A plant as claimed in claim 19, wherein said hydraulic devices comprise two pairs of pistons (130), a first pair associated with said upper half (102B), a second pair associated with a bedplate (103A).

21. An apparatus (100) for carrying out a partial

vulcanisation of a green pneumatic tyre being processed, said apparatus comprising: at least one hermetically sealed cavity (110) set to receive a toroidal support (10) carrying the tyre being processed, at least one heating device to generate heat at least on the surface of the toroidal support (10), at least one device for feeding a working fluid under pressure and associated with said cavity (110) to press the radially internal surface of the tyre being processed against the radially external surface of said toroidal support (10).

22. An apparatus as claimed in claim 21, wherein said heating device comprises at least one magnetic inductor (150).

23. An apparatus as claimed in claim 21, wherein said toroidal support (10) has a surface of ferromagnetic material.

24. An apparatus as claimed in claim 22, wherein said magnetic inductor (150) is an annular inductor having a C-shaped cross section and placed close to the inner side walls of said apparatus (100).

25. An apparatus as claimed in claim 22, wherein said magnetic inductor (150) has a power included between about 25 KW and about 60 KW.

26. An apparatus as claimed in claim 21, wherein said hermetically sealed cavity (110) is delimited by a lower half (102A) and an upper half (102B) of said apparatus (100).

27. An apparatus as claimed in claim 26, wherein said

upper half (102B) is linked to said lower half (102A) through at least one hinge (111) enabling rotation of same on a vertical plane of said apparatus (100).

28. An apparatus as claimed in claim 26, wherein at least one sealing element (107) is provided between the opposite surfaces of said lower (102A) and upper (102B) halves.

29. An apparatus as claimed in claim 21, wherein said device for feeding said working fluid contemplates the presence of a delivery duct (108) and an exhaust duct (109).

30. An apparatus as claimed in claim 26, wherein abutment surfaces (114) for horizontally supporting said toroidal support (10) within said cavity (110) are provided.

31. An apparatus as claimed in claim 30, wherein said abutment surfaces (114) are operatively associated with hydraulic devices to exert pressure on the shoulder regions of said toroidal support (10).

32. An apparatus as claimed in claim 31, wherein said hydraulic devices comprise two pairs of pistons (130), a first pair associated with said upper half (102B), a second pair associated with a bedplate (103A).